

Chemical Analysis Report

SE-DIST-2019-05-08-01

Florida Department of Environmental Protection
Central Laboratory
2600 Blair Stone Road
Tallahassee, FL 32399-2400
DOH Accreditation E31780

Event Description: **SMP-Stuart**
Request ID: **RQ-2019-05-06-43**
Customer: **SE-DIST**
Project ID: **SMP**

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Certified by: Thekkekalathil Chandrasekhar, Chemist Administrator

Date Certified: 29-MAY-2019 14:02



Case Narrative

Unless otherwise noted, all samples included in this report were received in accordance with protocols referenced in Chapter 62-160, Florida Administrative Code (F.A.C.). Results published in this report pertain only to the samples as submitted to, and received by the laboratory. All times in this report are adjusted to the applicable Eastern Time Zone (EST or EDT).

Results for the following analytical groups are included in this report: Metals and Nutrients.

Scientific notation may be used in reporting very large or small values. Values reported using scientific notation will take the form of the following example: 1.3E+03, which is equivalent to 1.3×10^3 or 1300.

Unless otherwise noted, analytical values for soil and sediment samples are reported on a dry weight basis, and analytical values for waste and tissue samples are reported on a wet weight basis.

Results for TNI accredited tests met requirements established by The NELAC Institute. A double asterisk (**) is used to indicate an analyte/matrix/method for which the laboratory is not TNI accredited by the Florida Department of Health Environmental Laboratory Certification Program or where accreditation for that field of testing is not applicable.

Any significant anomalies or deviations from established protocols are documented in Non-Conformance Reports, which, where appropriate, are included within this analytical report. Additional comments related to specific analytical tests may be included as remarks following the analytical results for each sample. Such comments and remarks are for informational purposes only and are not intended to convey judgement about the usability of the reported data.

A quality control report on the performance of the test method for the submitted samples is included. Uncertainty associated with the analytical results contained in this report can be estimated from the reported quality assurance results and from published quality control acceptance limits for each analytical test. Matrix quality control results (matrix spike recoveries and matrix sample precision) pertain only to the matrix sample tested and do not necessarily reflect test method performance for other samples.

Typical matrix quality control (QC) measurements may include matrix spike recovery, matrix spike duplicate recovery, matrix spike precision and matrix sample precision. Not all matrix QC results may be available or reportable; where they are not an explanation is provided. Typical reasons for unavailable QC results include, but are not limited to, a) insufficient matrix sample to perform some or all QC measurements; b) analyte concentration in the sample replicated was too low for a meaningful measurement of precision and c) analyte concentration in the matrix sample spiked was too high (relative to the amount of analyte spiked) for a meaningful measurement of recovery. Where matrix QC results are unavailable, other method performance metrics (e.g., LCS recovery, LCS precision, surrogate recovery) may be used to assess performance of the method. Comments explaining any missing QC measurements are not intended to convey any adverse conclusions about the quality of the reported data.

Precision is reported as relative percent difference unless otherwise noted.

Quality Control codes as defined below may be used in this report to indicate results that are associated with one or more quality control elements which did not fall within established test method criteria. Such results may be qualified as estimates using a J qualifier as required by 62-160 F.A.C. Explanations are included in the report for any results that were reported as estimates for other reasons.

QC Codes used in this report may include:

- LCS – Recovery for the batch Laboratory Control Sample (LCS) was outside existing control limits;
- MS – Recovery for the batch matrix spike (MS) was outside existing control limits;
- CCV – Recovery for a continuing calibration verification (CCV) standard was outside existing control limits;
- SUR – Recovery of a surrogate (SUR) for associated analytes was outside existing control limits;
- RPD – The precision, measured as relative percent difference (RPD), of batch replicate measurements was outside existing control limits;
- RSD – The precision, measured as relative standard deviation (RSD), of batch replicate measurements was outside existing control limits;
- SMP – Sample - used precision derived from replicate analyses of a sample;

The following data qualifiers are used, where applicable, in this report as specified in 62-160 F.A.C.

- A - Value reported is the mean of two or more determinations.
- B - Results based on colony counts outside the acceptable range.
- I - The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
- J - Estimated value and/or the analysis did not meet established quality control criteria.
- K - Actual value is known to be less than value given.
- L - Actual value is known to be greater than value given.
- N - Presumptive evidence of presence of material.
- O - Sampled, but analysis lost or not performed.
- Q - Sample held beyond normal holding time.
- T - Value reported is less than the criterion of detection.
- U - Material was analyzed for but not detected. The reported value is the method detection limit for the sample analyzed.
- V - Analyte was detected in both sample and method blank.
- X - Too few individuals to calculate SCI value.
- Y - The laboratory analysis was from an unpreserved or improperly preserved sample. The data may not be accurate.
- Z - Colonies were too numerous to count (TNTC).

Quality control information from overflow laboratories may not be included in this report. Please refer to the associated report from the overflow laboratory for additional information.

Sample Location: BESSEY CREEK @ MOUTH

Collection Date/Time: 05/07/2019 11:15

Field ID: G2SE0048

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2084629	EPA 180.1 Rev. 2.0	Turbidity	3.1		NTU	P363613	
	EPA 300.0	Bromide	20		mg Br/L	P363949	
	SM 2320 B-97	Total Alkalinity	163		mg CaCO3/L	P364172	
	SM 2540 D-97	TSS	6	I	mg/L	P364133	RPD
	SM 4500 F-C-97	Fluoride	0.49		mg F/L	P364176	
2084630	EPA 350.1 Rev. 2.0	Ammonia-N	0.032		mg N/L	P363909	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.83		mg N/L	P363931	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.13		mg N/L	P363974	
	EPA 365.1 Rev. 2.0	Total-P	0.14		mg P/L	P364384	
	SM 5310 B-00	Organic Carbon	10		mg C/L	P363995	
2084631	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.095		mg P/L	P363651	

Ref. Method and Comment:

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

Sample Location: WILLOUGHBY CREEK

Collection Date/Time: 05/07/2019 12:15

Field ID: G2SE0034

Matrix: W-SURF-SLT

Sample ID	Ref. Method	Component	Result	Code	Units	Batch ID	QC Codes
2084626	EPA 180.1 Rev. 2.0	Turbidity	3.3		NTU	P363613	
	EPA 300.0	Bromide	63		mg Br/L	P363949	
	SM 2320 B-97	Total Alkalinity	125		mg CaCO3/L	P364172	
	SM 2540 D-97	TSS	11	AJ	mg/L	P364133	RPD
	SM 4500 F-C-97	Fluoride	1.1		mg F/L	P364176	
2084627	EPA 350.1 Rev. 2.0	Ammonia-N	0.003	I	mg N/L	P363909	
	EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	0.32	I	mg N/L	P363931	
	EPA 353.2 Rev. 2.0	NO2NO3-N	0.004	U	mg N/L	P363973	
	EPA 365.1 Rev. 2.0	Total-P	0.034		mg P/L	P363876	
	SM 5310 B-00	Organic Carbon	3.4		mg C/L	P363922	
2084628	EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	0.017		mg P/L	P363651	
2084634	EPA 200.7 Rev. 4.4	Iron	120	U	ug/L	P363610	
		Magnesium	1.23E+03		mg/L	P363610	
		Manganese	7.7	I	ug/L	P363610	
		Zinc	20	U	ug/L	P363610	
	EPA 200.8 Rev. 5.4	Aluminum	137		ug/L	P363610	
		Antimony	0.22	I	ug/L	P363610	
		Arsenic	3.53		ug/L	P363610	
		Cadmium	0.080	U	ug/L	P363610	
		Chromium	4.0	U	ug/L	P363610	
		Copper	1.8	I	ug/L	P363610	
		Lead	2.0	U	ug/L	P363610	
		Nickel	2.0	U	ug/L	P363610	
		Selenium	0.80	U	ug/L	P363610	
		Silver	0.040	U	ug/L	P363610	
		Thallium	1.0	U	ug/L	P363610	

Ref. Method and Comment:

SM 2540 D-97: Refer to the narrative for an explanation of QC Codes.

SM 4500 F-C-97: Batch matrix spike recoveries are unavailable because of high analyte concentration in the QC sample.

EPA 200.7 Rev. 4.4: Batch matrix spike recoveries for magnesium are unavailable because of high analyte concentration in the QC sample.

Quality Assurance Report Method Blank Results

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P363613

Component	Result	Code	Units
Turbidity	0.10	U	NTU

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P363610

Component	Result	Code	Units
Iron	30	U	ug/L
Magnesium	0.040	U	mg/L
Manganese	1.0	U	ug/L
Zinc	5.0	U	ug/L

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P363610

Component	Result	Code	Units
Aluminum	5.0	U	ug/L
Antimony	0.050	U	ug/L
Arsenic	0.050	U	ug/L
Cadmium	0.020	U	ug/L
Chromium	0.40	U	ug/L
Copper	0.40	U	ug/L
Lead	0.20	U	ug/L
Nickel	0.50	U	ug/L
Selenium	0.20	U	ug/L
Silver	0.010	U	ug/L
Thallium	0.10	U	ug/L

Reference Method: EPA 300.0
Batch ID: P363949

Component	Result	Code	Units
Bromide	0.013	U	mg Br/L

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P363909

Component	Result	Code	Units
Ammonia-N	0.002	U	mg N/L

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P363931

Component	Result	Code	Units
Kjeldahl Nitrogen	0.080	U	mg N/L

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P363973

Component	Result	Code	Units
NO2NO3-N	0.004	U	mg N/L

Quality Assurance Report Method Blank Results

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P363974

Component	Result	Code	Units
NO2NO3-N	0.004	U	mg N/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P363876

Component	Result	Code	Units
Total-P	0.002	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364384

Component	Result	Code	Units
Total-P	0.002	U	mg P/L

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363651

Component	Result	Code	Units
O-Phosphate-P	0.004	U	mg P/L

Reference Method: SM 2320 B-97
Batch ID: P364172

Component	Result	Code	Units
Total Alkalinity	0.65	U	mg CaCO3/L

Reference Method: SM 2540 D-97
Batch ID: P364133

Component	Result	Code	Units
TSS	3	U	mg/L

Reference Method: SM 4500 F-C-97
Batch ID: P364176

Component	Result	Code	Units
Fluoride	0.035	U	mg F/L

Reference Method: SM 5310 B-00
Batch ID: P363922

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Reference Method: SM 5310 B-00
Batch ID: P363995

Component	Result	Code	Units
Organic Carbon	0.50	U	mg C/L

Quality Assurance Report Laboratory Control Sample Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P363610

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Iron	104		P	85 - 115
Magnesium	101		P	85 - 115
Manganese	101		P	85 - 115
Zinc	101		P	85 - 115

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P363610

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Aluminum	94.2		P	85 - 115
Antimony	97.6		P	85 - 115
Arsenic	102		P	85 - 115
Cadmium	98.8		P	85 - 115
Chromium	103		P	85 - 115
Copper	97.9		P	85 - 115
Lead	100		P	85 - 115
Nickel	98.8		P	85 - 115
Selenium	100		P	85 - 115
Silver	97.4		P	85 - 115
Thallium	101		P	85 - 115

Reference Method: EPA 300.0
Batch ID: P363949

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Bromide	102		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P363909

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Ammonia-N	104		P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P363931

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Kjeldahl Nitrogen	108		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P363973

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	99.0		P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P363974

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
NO2NO3-N	100		P	90 - 110

Quality Assurance Report

Laboratory Control Sample Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P363876

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	98.4		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364384

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total-P	101		P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363651

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
O-Phosphate-P	101		P	90 - 110

Reference Method: SM 2320 B-97
Batch ID: P364172

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Total Alkalinity	103		P	98 - 106

Reference Method: SM 4500 F-C-97
Batch ID: P364176

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Fluoride	96.7		P	92 - 103

Reference Method: SM 5310 B-00
Batch ID: P363922

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	89.2		P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P363995

Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
Organic Carbon	87.7		P	85 - 115

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P363610

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084100	Iron	99.5	99.1	P/P	80 - 120
2084100	Manganese	96.5	95.2	P/P	80 - 120
2084100	Zinc	100	99.6	P/P	80 - 120

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P363610

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084100	Aluminum	95.6	94.3	P/P	70 - 130
2084100	Antimony	102	101	P/P	70 - 130
2084100	Arsenic	110	110	P/P	70 - 130
2084100	Cadmium	97.9	96.3	P/P	70 - 130
2084100	Chromium	96.0	93.6	P/P	70 - 130
2084100	Copper	94.5	94.6	P/P	70 - 130
2084100	Lead	104	104	P/P	70 - 130
2084100	Nickel	97.3	99.2	P/P	70 - 130
2084100	Selenium	100	102	P/P	70 - 130
2084100	Silver	90.7	91.0	P/P	70 - 130
2084100	Thallium	103	104	P/P	70 - 130

Reference Method: EPA 300.0
Batch ID: P363949

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2085500	Bromide	97.5	98.9	P/P	90 - 110
2085617	Bromide	101		P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P363909

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084630	Ammonia-N	105	105	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P363931

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084004	Kjeldahl Nitrogen	101	104	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P363973

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084001	NO2NO3-N	102	102	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P363974

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084630	NO2NO3-N	102	102	P/P	90 - 110

Quality Assurance Report Matrix Spike Accuracy

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P363876

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084736	Total-P	104	104	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364384

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2086129	Total-P	97.0	98.2	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363651

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084522	O-Phosphate-P	96.8	98.1	P/P	90 - 110

Reference Method: SM 5310 B-00
Batch ID: P363922

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2083174	Organic Carbon	90.6	91.5	P/P	85 - 115

Reference Method: SM 5310 B-00
Batch ID: P363995

Spiked Sample	Component	% Rec.1	% Rec.2	Pass/Fail	Control Limits
2084630	Organic Carbon	87.9	87.7	P/P	85 - 115

Quality Assurance Report Precision

Reference Method: EPA 180.1 Rev. 2.0
Batch ID: P363613

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084450	Turbidity	0.0	Sample	P	0 - 20

Reference Method: EPA 200.7 Rev. 4.4
Batch ID: P363610

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084100	Iron	0.411	Spike	P	0 - 20
2084100	Magnesium	0.211	Spike	P	0 - 20
2084100	Manganese	1.12	Spike	P	0 - 20
2084100	Zinc	0.562	Spike	P	0 - 20

Reference Method: EPA 200.8 Rev. 5.4
Batch ID: P363610

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084100	Aluminum	1.24	Spike	P	0 - 20
2084100	Antimony	0.858	Spike	P	0 - 20
2084100	Arsenic	0.130	Spike	P	0 - 20
2084100	Cadmium	1.67	Spike	P	0 - 20
2084100	Chromium	2.49	Spike	P	0 - 20
2084100	Copper	0.0273	Spike	P	0 - 20
2084100	Lead	0.512	Spike	P	0 - 20
2084100	Nickel	1.99	Spike	P	0 - 20
2084100	Selenium	1.77	Spike	P	0 - 20
2084100	Silver	0.344	Spike	P	0 - 20
2084100	Thallium	0.806	Spike	P	0 - 20

Reference Method: EPA 300.0
Batch ID: P363949

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2085500	Bromide	1.14	Spike	P	0 - 20

Reference Method: EPA 350.1 Rev. 2.0
Batch ID: P363909

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084630	Ammonia-N	0.0594	Spike	P	0 - 20

Reference Method: EPA 351.2 Rev. 2.0
Batch ID: P363931

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084004	Kjeldahl Nitrogen	2.66	Spike	P	0 - 20

Quality Assurance Report Precision

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P363973

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084001	NO2NO3-N	0.980	Spike	P	0 - 20

Reference Method: EPA 353.2 Rev. 2.0
Batch ID: P363974

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084630	NO2NO3-N	0.298	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P363876

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084736	Total-P	0.577	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0
Batch ID: P364384

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2086129	Total-P	1.15	Spike	P	0 - 20

Reference Method: EPA 365.1 Rev. 2.0 dissolved
Batch ID: P363651

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084522	O-Phosphate-P	1.33	Spike	P	0 - 20

Reference Method: SM 2320 B-97
Batch ID: P364172

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084080	Total Alkalinity	0.393	Sample	P	0 - 2.8

Reference Method: SM 2540 D-97
Batch ID: P364133

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084626	TSS	10.9	Sample	F	0 - 10

Reference Method: SM 4500 F-C-97
Batch ID: P364176

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084080	Fluoride	1.42	Spike	P	0 - 2.5

Quality Assurance Report Precision

Reference Method: SM 5310 B-00
Batch ID: P363922

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2083174	Organic Carbon	0.900	Spike	P	0 - 20

Reference Method: SM 5310 B-00
Batch ID: P363995

Replicated Lab Sample	Component	% RSD/RPD	Sample/Spike/LCS*	Pass/Fail	Control Limits
2084630	Organic Carbon	0.132	Spike	P	0 - 20

* Sample, spike and/or laboratory control sample precision (LCS) is reported.
Replicate spike precision may be reported when sample results are below quantifiable levels.

Quality Assurance Report Calibration Verification

Reference Method: EPA 180.1 Rev. 2.0

Run ID: A91297

Included Lab Sample IDs: 2084626, 2084629

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Turbidity	99.5	99.0	P/P	95 - 105

Reference Method: EPA 365.1 Rev. 2.0 dissolved

Run ID: A91312

Included Lab Sample IDs: 2084628, 2084631

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
O-Phosphate-P	98.1	99.6	P/P	90 - 110

Reference Method: EPA 200.7 Rev. 4.4

Run ID: A91335

Included Lab Sample IDs: 2084634

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Iron	102	99.6	P/P	90 - 110
Magnesium	104	99.7	P/P	90 - 110
Manganese	101	100	P/P	90 - 110
Zinc	102	101	P/P	90 - 110

Reference Method: EPA 300.0

Run ID: A91402

Included Lab Sample IDs: 2084626, 2084629

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Bromide	107	108	P/P	90 - 110

Reference Method: EPA 350.1 Rev. 2.0

Run ID: A91412

Included Lab Sample IDs: 2084627, 2084630

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Ammonia-N	105	106	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A91414

Included Lab Sample IDs: 2084627

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	92.0	93.2	P/P	90 - 110

Reference Method: EPA 353.2 Rev. 2.0

Run ID: A91438

Included Lab Sample IDs: 2084627, 2084630

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
NO2NO3-N	98.5	99.0	P/P	90 - 110
NO2NO3-N	99.5	98.5	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A91443

Included Lab Sample IDs: 2084634

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Aluminum	94.4	93.1	P/P	90 - 110
Antimony	97.2	98.4	P/P	90 - 110
Arsenic	98.9	100	P/P	90 - 110
Cadmium	96.2	97.0	P/P	90 - 110
Copper	97.7	98.2	P/P	90 - 110
Lead	99.8	99.9	P/P	90 - 110
Nickel	98.2	98.6	P/P	90 - 110
Selenium	97.3	99.1	P/P	90 - 110
Silver	94.9	95.2	P/P	90 - 110
Thallium	94.8	95.0	P/P	90 - 110

Reference Method: SM 5310 B-00

Run ID: A91449

Included Lab Sample IDs: 2084630

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Organic Carbon	91.9	93.0	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A91455

Included Lab Sample IDs: 2084627

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	99.2	98.8	P/P	90 - 110

Reference Method: EPA 351.2 Rev. 2.0

Run ID: A91497

Included Lab Sample IDs: 2084627, 2084630

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Kjeldahl Nitrogen	103	102	P/P	90 - 110

Reference Method: SM 2320 B-97

Run ID: A91513

Included Lab Sample IDs: 2084626, 2084629

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total Alkalinity	101	103	P/P	90 - 110
Total Alkalinity	103	101	P/P	90 - 110

Reference Method: SM 4500 F-C-97

Run ID: A91513

Included Lab Sample IDs: 2084626, 2084629

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Fluoride	98.1	98.1	P/P	90 - 110
Fluoride	98.1	97.6	P/P	90 - 110

Quality Assurance Report Calibration Verification

Reference Method: EPA 200.8 Rev. 5.4

Run ID: A91520

Included Lab Sample IDs: 2084634

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Chromium	97.0	97.1	P/P	90 - 110

Reference Method: EPA 365.1 Rev. 2.0

Run ID: A91619

Included Lab Sample IDs: 2084630

Component	% Rec.1	% Rec.2	Pass/Fail*	Control Limits
Total-P	101	102	P/P	90 - 110

* Pass/Fail determinations are made for each bracketing calibration verification check.

Control limits for initial calibration checks may be different from those for continuing checks, depending on method requirements.

Where they are different, both control limits are provided.

Quality Assurance Report Summary

Ref. Method	Analyte	LCS % Recovery	MS % Recovery		LCS	Precision SMP	MS
EPA 180.1 Rev. 2.0	Turbidity					0.0	
EPA 200.7 Rev. 4.4	Iron	104	99.5	99.1			0.411
	Magnesium	101					0.211
	Manganese	101	96.5	95.2			1.12
	Zinc	101	100	99.6			0.562
EPA 200.8 Rev. 5.4	Aluminum	94.2	95.6	94.3			1.24
	Antimony	97.6	102	101			0.858
	Arsenic	102	110	110			0.130
	Cadmium	98.8	97.9	96.3			1.67
	Chromium	103	96.0	93.6			2.49
	Copper	97.9	94.5	94.6			0.0273
	Lead	100	104	104			0.512
	Nickel	98.8	97.3	99.2			1.99
	Selenium	100	100	102			1.77
	Silver	97.4	90.7	91.0			0.344
	Thallium	101	103	104			0.806
EPA 300.0	Bromide	102	97.5	98.9	101		1.14
EPA 350.1 Rev. 2.0	Ammonia-N	104	105	105			0.0594
EPA 351.2 Rev. 2.0	Kjeldahl Nitrogen	108	101	104			2.66
EPA 353.2 Rev. 2.0	NO ₂ NO ₃ -N	99.0	102	102			0.980
	NO ₂ NO ₃ -N	100	102	102			0.298
EPA 365.1 Rev. 2.0	Total-P	98.4	104	104			0.577
	Total-P	101	97.0	98.2			1.15
EPA 365.1 Rev. 2.0 dissolved	O-Phosphate-P	101	96.8	98.1			1.33
SM 2320 B-97	Total Alkalinity	103				0.393	
SM 2540 D-97	TSS					10.9	
SM 4500 F-C-97	Fluoride	96.7					1.42
SM 5310 B-00	Organic Carbon	89.2	90.6	91.5			0.900
	Organic Carbon	87.7	87.9	87.7			0.132

Reference Method Descriptions

Method / DoH Cert #	Description	Associated Samples
EPA 180.1 Rev. 2.0 / E31780	Turbidity in aqueous matrices	2084626, 2084629
EPA 200.7 Rev. 4.4 / E31780	Total Recoverable Metals analysis using ICP emission spectroscopy for aqueous samples supporting Clean Water Act Projects	2084634
EPA 200.8 Rev. 5.4 / E31780	Total Recoverable Metals analysis using ICP-MS for aqueous samples supporting Clean Water Act Projects	2084634
EPA 300.0 / E31780	Bromide in aqueous matrices	2084626, 2084629
EPA 350.1 Rev. 2.0 / E31780	Ammonia in aqueous matrices as mg N/L	2084627, 2084630
EPA 351.2 Rev. 2.0 / E31780	Total Kjeldahl Nitrogen in aqueous matrices	2084627, 2084630
EPA 353.2 Rev. 2.0 / E31780	Nitrite/Nitrate in aqueous matrices as mg N/L	2084627, 2084630
EPA 365.1 Rev. 2.0 / E31780	Total Phosphorus in aqueous matrices as mg P/L	2084627, 2084630
EPA 365.1 Rev. 2.0 dissolved / E31780	Ortho-phosphate, dissolved, in filtered, aqueous matrices as mg P/L	2084628, 2084631
SM 2320 B-97 / E31780	Alkalinity in aqueous matrices as mg CaCO ₃ /L	2084626, 2084629
SM 2540 D-97 / E31780	Total Suspended Solids in aqueous matrices using a maximum of 250 mL of sample	2084626, 2084629
SM 4500 F-C-97 / E31780	Fluoride in aqueous matrices, without distillation (not valid for NPDES monitoring)	2084626, 2084629
SM 5310 B-00 / E31780	Nonpurgeable Organic Carbon in aqueous matrices	2084627, 2084630

Preparation and Analysis Log

Ref. Method	Received Date	Prep Date/Time	Prepared By	Analysis Date/Time	Analyzed By	Associated Samples
EPA 180.1 Rev. 2.0	05/08/2019			05/08/2019 16:03	Adrian Shelby	2084626, 2084629
EPA 200.7 Rev. 4.4	05/08/2019	05/08/2019 16:10	Elliott D. Healy	05/09/2019 16:18	Betina Topolski	2084634
	05/08/2019	05/08/2019 16:10	Elliott D. Healy	05/09/2019 16:29	Betina Topolski	2084634
EPA 200.8 Rev. 5.4	05/08/2019	05/08/2019 16:10	Elliott D. Healy	05/15/2019 09:49	Martin Acosta	2084634
	05/08/2019	05/08/2019 16:10	Elliott D. Healy	05/15/2019 11:15	Martin Acosta	2084634
	05/08/2019	05/08/2019 16:10	Elliott D. Healy	05/17/2019 16:48	Martin Acosta	2084634
EPA 300.0	05/08/2019			05/14/2019 16:54	Lipi Saha	2084626
	05/08/2019			05/14/2019 17:11	Lipi Saha	2084629
EPA 350.1 Rev. 2.0	05/08/2019			05/13/2019 13:32	Ping Hua	2084630
	05/08/2019			05/13/2019 13:36	Ping Hua	2084627
EPA 351.2 Rev. 2.0	05/08/2019	05/14/2019 12:30	Adrian Shelby	05/17/2019 10:00	Joseph Suarez	2084627
	05/08/2019	05/14/2019 12:30	Adrian Shelby	05/17/2019 10:02	Joseph Suarez	2084630
EPA 353.2 Rev. 2.0	05/08/2019			05/15/2019 08:23	Beverly Y. Sanders	2084627
	05/08/2019			05/15/2019 08:30	Beverly Y. Sanders	2084630
EPA 365.1 Rev. 2.0	05/08/2019	05/14/2019 10:06	Joseph Suarez	05/15/2019 14:10	Rosalyn Ballman	2084627
	05/08/2019	05/22/2019 02:01	Lipi Saha	05/22/2019 19:12	Rosalyn Ballman	2084630
EPA 365.1 Rev. 2.0 dissolved	05/08/2019			05/08/2019 14:58	Jhamieka S. Greenwood	2084631
	05/08/2019			05/08/2019 14:59	Jhamieka S. Greenwood	2084628
SM 2320 B-97	05/08/2019			05/17/2019 08:16	Dale L. Simmons	2084629
	05/08/2019			05/17/2019 10:50	Dale L. Simmons	2084626
SM 2540 D-97	05/08/2019			05/10/2019 16:05	Yijie Li	2084626, 2084629
SM 4500 F-C-97	05/08/2019			05/17/2019 06:16	Dale L. Simmons	2084629
	05/08/2019			05/17/2019 07:39	Dale L. Simmons	2084626
SM 5310 B-00	05/08/2019			05/14/2019 11:48	Julia Storbeck	2084627
	05/08/2019			05/15/2019 09:02	Julia Storbeck	2084630